

We claim:

Sub A17

5 1. A range measuring device comprising a waveform adaptive ultra-wideband transmitter, said range measuring device comprising:

a signal generator to generate a waveform adaptive ultra-wideband signal;

10 an antenna responsive to said signal generator to radiate a signal representing said ultra-wideband signal; and

a receiver for receiving said radiated ultra-wideband signal.

15 2. A communication system utilizing an ultra-wideband transmitter, said ultra-wideband transmitter comprising:

a signal generator to generate a waveform adaptive ultra-wideband signal;

20 an antenna responsive to said signal generator to radiate a representation of said ultra-wideband signal; and

a receiver for receiving said radiated ultra-wideband signal.

25 3. A method for detecting an object utilizing ultra-wideband transmitting techniques, said method comprising:

a signal generator to generate a waveform adaptive ultra-wideband signal;

30 an antenna responsive to said signal generator to radiate a signal representing said ultra-wideband signal; and

a receiver for receiving said radiated ultra-wideband signal.

4. A waveform adaptive ultra-wideband transmitter comprising:

5 a signal generator to generate a series of discrete low-level ultra-wideband signals having a selectable carrier frequency;

10 a waveform adapter responsive to said low-level ultra-wideband signals and including at least one of a bandpass filter, a mixer, a pulse shaper, and an attenuator that controls one of frequency, pulse shape, bandwidth, phase, multi-level amplitude, and multi-level attenuation of said low-level ultra-wideband signals; and

15 an antenna responsive to said waveform adapter to radiate ultra-wideband signals.

5. The ultra-wideband transmitter according to claim 4, wherein:

20 said waveform adapter controls said low-level ultra-wideband signal on a dynamic, real-time basis.

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